



First report of a variant of Tomato leaf curl Bangladesh virus infecting Gaillardia

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Received: 06 May 2012. Published: 09 Aug 2012. Keywords: whitefly, geminivirus

In October 2009 leaf yellowing symptoms of Gaillardia, popularly known as blanket flower (*Gaillardia pulchella*) were observed in more than 50% of plants growing in fields of Fatehnagar village in the Udaipur district of Rajasthan, India. Infected plants exhibited vein yellowing (Fig. 1) where in severe extreme cases entire leaflets showed severe yellowing, crumpling and distortion (Fig. 2). Infected plants were dwarfed with smaller sized flowers and had reduced or no commercial value. A similar incidence of diseased plants with identical symptoms was noted in the fields in 2010 and 2011 together with the appearance of diseased plants in a nearby lawn. It was shown that the causal agent of the disease was transmitted by whiteflies (*Bemisia tabaci*) by artificial inoculation of susceptible plants following a six hour acquisition and inoculation feeding period by whiteflies; this produced similar symptoms to those observed in the field.

The presence of a *Begomovirus* was detected by PCR using *Begomovirus* specific oligonucleotide (Rojas *et al.*, 1993). A full-length DNA-A molecule 2761 bp long was amplified from symptom-bearing leaves and its sequence submitted to GenBank (Accession No. JQ765395). Sequence analysis using the BLAST programme revealed nucleotide sequence identities of 94.0% with Tomato leaf curl Bangladesh virus-[Bangladesh:2] (ToLCBDV-[BD:2]) (AF188481), and 92.0% with Chilli leaf curl virus-DU [India: New Delhi: Papaya:2009 (HM140364)]. As per the criteria proposed by Fauquet *et al.* (2008) the virus infecting Gaillardia is considered to be the variant of Tomato leaf curl Bangladesh virus-[Bangladesh:2]. Accordingly the virus was named as Tomato leaf curl Bangladesh virus-Gaillardia [India: Udaipur: Gaillardia:2009]

ToLCBDV-Gaill [IN: UDR: Gaill: 2009].

This is the first report of *Begomovirus* infection of Gaillardia. Begomoviruses are causing devastating losses to economically important vegetables, pulses, ornamentals and fibre crops. In pulses alone such viruses have been estimated to cause USD 300 million losses (Varma & Malathi, 2003). Commercial floriculture in India is a rapidly expanding industry and disease impact is an important factor. Gaillardia is one of the hardiest annuals grown on a variety of soils. It is an attractive flower available in single or semi-doubles with appealing colours. It is an important substitute to the well-known cut flower chrysanthemum.

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Figure 1



Figure 2

To cite this report: Mahatma L, Mahatma MK, 2012. First report of a variant of Tomato leaf curl Bangladesh virus infecting Gaillardia. *New Disease Reports* **26**, 4. [<http://dx.doi.org/10.5197/j.2044-0588.2012.026.004>]

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